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The Effects of SOES on the Nasdaq Market

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This report responds to your request that we study the Small Order Execution System (SOES) and its effects on the Nasdaq Stock Market.[1] SOES is a securities trading system that provides immediate automated executions of trades in the Nasdaq Market. Our objectives were to determine (1) the extent to which SOES is being used for its intended purpose, (2) the effects of SOES on the marketplace, (3) the results of attempts to limit trading on SOES or replace SOES, and (4) the effects of recent market developments and proposals affecting SOES.

Background

How the Nasdaq Stock Market Works

The Nasdaq Market is a market for securities traded "over-the-counter" through a network of computers and telephones, rather than on a stock exchange floor. Nasdaq is an electronic communications system in which certain NASD member broker-dealers act as market makers by quoting prices at which they are willing to buy ("bid quote") or sell ("ask quote") securities for their own accounts or for their customers. For the securities that are listed on the Nasdaq system, market makers enter into the system their bid and ask quotes and the number of shares they are willing to buy or sell (referred to as "depth" or "size"). Market makers are obligated to trade at the depth that they are publicly displaying under Nasdaq's firm quote rule.[2] Market makers often choose, or under best execution obligations are required, to provide executions at least as favorable as that

[1]The Nasdaq Stock Market, Inc., is a wholly-owned subsidiary of the National Association of Securities Dealers (NASD), a registered securities association. Nasdaq began operation in 1971 as the first screen-based stock market for non-exchange listed securities.

[2]The firm quote rule requires that a market maker execute a transaction at its displayed quotations for at least a normal unit of trading, 100 shares, or for the actual size of the quotation if it is greater than the normal unit.

being displayed publicly by other participants, regardless of whether the market maker itself is publicly displaying that price or depth.

The Nasdaq computer system brings together the bid, ask, and depth quotations of the numerous market makers for all Nasdaq-listed securities for display to Nasdaq member broker-dealers and other subscribers. The Nasdaq workstation, through which all Nasdaq market makers and other member broker-dealers can view the market, displays and continuously updates bid and ask prices and the quote depth in a montage of quotes for each listed security. The Nasdaq Market has thus been referred to as a "dealer" market in which prices are set by the interaction of dealer quotes, although, as discussed later, this has changed under SEC's Order Handling Rules to include the interaction of limit orders.[3]

In such a dealer market, market makers have the responsibility to provide liquidity by being continuously willing to buy and sell the security or securities in which they are making a market (or risking their capital), at least at their publicly quoted prices. Liquidity is the ease with which the market can accommodate large volumes of securities trading without significant price changes. As a result, an individual who wants to buy or sell a security at the quoted price would not have to wait until someone is found who wishes to take the opposite side in the desired transaction. The difference between the listed bid and ask prices is the "spread" that market makers retain as compensation for their effort and risk.

Investors who want to buy or sell Nasdaq-listed securities place orders with broker-dealers. The brokers have several ways to handle the orders. If the broker makes a market in the stock, it may execute the order itself, generally through its own internal automated execution system. If the broker does not make a market in the stock, it may send the order to market makers through Nasdaq's automated order entry and delivery system, called SelectNet. SelectNet orders may either be directed to a specific market maker or broadcast generally to all market makers. In conformance with SEC and NASD rules, market makers must execute directed SelectNet orders, commonly referred to as "preferenced" orders,[4] up to their displayed quotation size, if the orders are priced equal to their quote, unless the market maker has just traded or moved its quote.

[3]A limit order is a customer order to buy or sell a security at a specific price.

[4]Preferenced orders are executed at the best quoted price, even though that price may not be that market maker's quoted price. However, market maker's can designate the securities for which they are willing to accept preferenced orders. Unpreferenced orders are routed on a rotational basis to the SOES market makers quoting the best bid or ask prices and are executed at those prices.

Directed orders that must be executed are commonly referred to as "liability" orders. Other nonliability SelectNet orders can be accepted, negotiated, or declined by one or more market makers. Brokers may enter small orders of up to 1,000 shares for most stocks into SOES, where they are automatically executed without negotiation. The broker may negotiate large orders or those requiring special handling directly with one or more market makers.

How SOES Works

SOES is a system that allows small orders placed through it to be automatically executed against Nasdaq market makers at the best bid or ask prices displayed on the Nasdaq system. SOES trading has generally represented less than 10 percent of total Nasdaq shares traded. SOES can be used by NASD member firms that register as participating SOES order entry firms. These firms may only enter orders that have been received from their public customers. Some of these firms' primary, if not exclusive, business line is SOES trading. We call these firms SOES day trading firms. All Nasdaq market makers in Nasdaq National Market securities (Nasdaq's largest stocks, accounting for over 90 percent of Nasdaq volume) must be SOES market makers and receive SOES executions from SOES order entry firms. Participation in SOES by market makers in Nasdaq's smaller securities (called Small Cap securities) is voluntary.

Market makers can also use SOES to execute their customer orders. However, Nasdaq rules do not allow market makers to enter orders into SOES for stocks for their proprietary trading (trading for their own account).

Before January 1997, SOES rules generally required market makers to quote a minimum of 1,000 shares to buy or sell (for some less actively traded shares, the minimums may be 500 or 200 shares). Under a pilot program begun in January 1997, called the actual size pilot, these regulatory minimums were removed for 150 test stocks, and market makers were allowed to enter quotations at any size in 100 share increments (and multiples of 100). SEC approved the expansion of actual size rules to all Nasdaq stocks on July 15, 1998, effective July 20, 1998.

Results in Brief

NASD developed SOES to provide automatic access to the Nasdaq Market and market makers for the securities orders of small, retail investors. However, 1995 NASD data show that the primary users of SOES, accounting for over 80 percent of SOES trading volume, are SOES day trading firms.

These firms generally have provided access to SOES and proprietary computer software to assist the trading of day traders. Day traders usually (1) trade the maximum number of shares allowed on SOES, (2) trade frequently during the day, and (3) rarely carry an inventory of securities overnight. Market makers told us that many retail investors' orders are being filled by market makers using their own internal automated systems, at prices that are to match the best Nasdaq prices. The day traders have used a trading advantage provided by the automatic execution feature of SOES, proprietary software the SOES day trading firms designed to benefit from this feature, and Nasdaq rules that limited market maker access to SOES, to profit at the expense of market makers and their customers. This advantage has diminished over time because of market maker software improvements and changes in trading rules.

Not surprisingly, market makers and SOES day trading firm officials disagree about the effects of SOES day trading on the market. For example, market makers told us that day traders are market professionals, who should not have an advantage in the marketplace. They said that the day traders not only profit at the expense of market makers, but also cause losses for market maker customers, who may have to buy at higher prices and sell at lower prices than they otherwise would. In contrast, SOES day trading firm officials said that day trader activity has forced market makers to monitor and update their quotes, or prices, and has ensured that orders from individual investors are automatically executed at the best prices. The various studies that have attempted to assess SOES effects on the market have not effectively isolated the effects of SOES from those of many other changes in the market, such as revised trading rules, that have occurred during the same time SOES has been operating.

NASD has proposed various rule changes to reduce or eliminate the advantage of SOES day traders. SEC approved some of the earlier rule changes. However, a court decision in favor of a SOES day trader, as well as two separate investigations by the Department of Justice and SEC of market maker collusion to fix prices on the Nasdaq Market, which market makers eventually settled without admitting or denying guilt, strengthened the position of the SOES day trading firms and their day traders. SEC officials told us that they had become more skeptical of NASD rule proposals to change SOES, and that NASD had failed in two attempts to eliminate SOES' automatic execution feature in favor of systems that attempted to limit the availability of automatic executions exclusively to smaller investors and that routed orders to market makers for execution.

Despite NASD's lack of success in controlling SOES traders through rule changes, the volume of SOES trading as a percentage of total Nasdaq share volume has been declining, from almost 8 percent in January 1997 to less than 5 percent in 1998. Some of the factors that may have influenced this decline include changes in SEC and NASD rules, increased use of ECNs by SOES day traders, and market makers' use of their internal automated trading systems. To make automatic trade executions more widely available, Nasdaq has proposed an Integrated Order Delivery and Execution System that would replace two existing systems, including SOES, and provide an integrated order routing and execution system and a voluntary limit order file, in which customer orders at specified prices could be matched and executed. This system would allow market makers, as well as SOES day traders, access to automatic execution of all trades. Nasdaq officials told us that this system, among other things, is intended to eliminate the unintended double liability incurred by market makers as a result of SOES day trading, without unduly benefiting market makers. This double liability arises because market makers are required to execute trades against their quotes through both SelectNet and SOES. However, some features of the proposed system are controversial, and SEC has received about 2,100 public comment letters on the system.

Scope and Methodology

To determine the extent to which SOES was being used for its intended purpose and how it has performed, we interviewed officials from NASD and SEC and reviewed agency documents. We also interviewed selected market participants about their use of SOES, including officials from seven market making firms, five of which were among the largest Nasdaq trading firms; three SOES day trading firms; one mutual fund; and two industry trade associations, one representing market makers and the other SOES day trading firms.

To determine past NASD attempts to limit SOES day trading, we reviewed NASD proposed rule changes and SEC approval orders. We interviewed current and former SEC officials to obtain information on the reasons for which changes were or were not approved. We also reviewed pertinent SEC reports, primarily its 21(a) report,[5] public comment letters, and other documents.

To determine the effects of SOES on the marketplace, we interviewed the previously listed selected market participants. We also reviewed and

[5]Report Pursuant to Section 21(a) of the Securities Exchange Act of 1934 Regarding the NASD and the Nasdaq Market, U.S. Securities and Exchange Commission (August 8, 1996).

analyzed the following six studies on the market effects of SOES: (1) The Importance of Firm Quotes and Rapid Executions: Evidence From the January 1994 SOES Rule Changes by Jeffrey Harris and Paul Schultz; (2) SOES Trading and Market Volatility by Robert H. Battalio, Brian Hatch, and Robert Jennings; (3) Day Trading on Nasdaq's Automatic Small Order Execution System (SOES): Adverse Selection and Spread by George Benston and Robert Wood; (4) Nasdaq Market Reform: New Evidence That Competition From the Public Lowers Trading Costs by Michael J. Barclay, William G. Christie, Jeffrey Harris, Eugene Kandel, and Paul H. Shultz; (5) Effects of the Removal of Minimum Sizes for Proprietary Quotes in the Nasdaq Stock Market by the staff of NASD Economic Research; and (6) SOES and the Nasdaq Stock Market by Nasdaq Economic Research (Dean Furbush, D. Timothy McCormick, Kathleen L. Mitchel, Lorraine M. Reilly, James P. Selway III, and Michael P. Watson). In addition, we interviewed other academicians about SOES, as well as the Chief Economist at NASD and officials from SEC's Division of Market Regulation. We also interviewed the selected market participants about the various studies.

To determine the recent market developments and proposals affecting SOES, we reviewed SEC and NASD rule changes since December 1996 concerning SOES and the latest NASD proposal to replace SOES.[6] We interviewed the selected market participants to obtain their views on the proposed SOES replacement system and reviewed public comment letters.

We did our work in accordance with generally accepted government auditing standards between October 1997 and July 1998 in Washington, D.C.; Baltimore, MD; New York, NY, and vicinity; and Houston, TX.

NASD Established SOES to Provide Automatic Execution of Small Retail Orders, but It Has Been Used Primarily by Day Traders

NASD established SOES in 1984 as a means for market makers to provide timely and efficient execution and processing of small retail orders. When first established, SOES was a voluntary system for market makers that allowed them to lower their processing costs by providing automatic execution for these orders at the best available prices. After the 1987 stock market crash, during which many market makers withdrew from SOES and small investors had difficulty executing their orders, NASD made market maker participation in SOES mandatory for Nasdaq National Market securities. Since then, SOES day trading firms have developed trading strategies to take advantage of the automatic execution feature of SOES, and day traders have become the primary users of SOES. The day traders

[6]Release No. 34-39718; File No. FN SR-NASD-98-17, March 4, 1998.

trade frequently, usually trade the maximum number of shares allowed on SOES, and rarely carry an inventory of securities from one day to the next. SOES has provided the day traders and its other users access to market makers during the periods of high trading volume that have occurred since the 1987 market crash.

NASD Established SOES to Provide Automatic Execution of Small Retail Orders

Nasdaq market makers recognized the need for increased automation of the over-the-counter market when, during a surge of trading volume that began in the fall of 1982, the handling of routine small orders became an increasing burden for them. In November 1984, NASD submitted a proposed rule change to SEC to reduce this burden. The submission announced that NASD had developed a new, automated, small order execution system for routing and executing limited sized orders in over-the-counter securities. Its purpose was twofold: to improve the efficiency of these securities transactions by allowing the orders of brokers' small retail customers to be sent electronically to Nasdaq market makers, and to receive automatic executions at the best bid or ask price. The orders, initially of 500 shares or less, were to be sent on a rotating basis to competing market makers, who could participate on a voluntary basis. In general, such small orders are considered to be of a size less likely to cause a movement in a stock's price or significantly reduce available liquidity. Member firms could participate in SOES as either market makers or order entry firms. SOES was approved by SEC in February 1985.

The automatic execution feature of SOES is consistent with the objectives of the 1975 Securities Acts Amendments. These amendments set forth five objectives for the securities markets to function in the public interest, provide appropriate protection of investors, and maintain fair and orderly markets. The objectives are (1) efficient execution of securities transactions; (2) fair competition among market participants; (3) widespread availability of quotation and trade information; (4) the practicability of orders executed in the best market; and (5) the opportunity, consistent with the foregoing provisions, for investors' orders to be executed without dealer participation. SOES provides for efficient execution of investors' orders at the best bid or ask price without negotiating with a dealer.

Market Crisis Was Basis for Making SOES Participation Mandatory

From October 14 through 21, 1987, the U.S. stock markets experienced an accelerated decline and record trading volumes. The Dow Jones Industrial Average (DJIA) fell by over 30 percent—the largest decline since the market crash of October 1929. The Nasdaq composite index declined 27.2 percent during October 1987, while Nasdaq trading volume reached the unprecedented level of 288 million shares on October 21, 1987.

Market makers withdrew from voluntary SOES participation during the decline, making it necessary for trades that would have been executed automatically by SOES to be handled by contacting a market maker by telephone. This added to the already high volume of telephone calls to market makers, making them unusually difficult to contact. Consequently, many investors could not contact market makers and obtain executions of trades. The result was a severe reduction of liquidity in the Nasdaq market, particularly for small retail investors.

Despite the withdrawals by some market makers, SOES remained open and in operation throughout the October 1987 market crash and, according to SEC, continued to provide an effective means for the execution of small orders. However, the difficulty experienced by small investors in accessing the market during the break caused NASD, with SEC encouragement, to conclude that enhancements to SOES and Nasdaq were needed. In March 1988, NASD proposed rule changes that SEC approved in June 1988. The rule changes (1) prohibited a firm that withdraws, on an unexcused basis, as a Nasdaq market maker in a security from reentering Nasdaq as a market maker in that security for 20 business days; (2) made SOES participation mandatory for all market makers in Nasdaq National Market securities; (3) enabled NASD to establish different levels of maximum order size limits of 200, 500, and 1,000 shares for SOES orders in national market securities, depending on the trading characteristics of the different securities; and (4) required a market maker to execute a minimum of 5 trades at a security's maximum order size.

The various public commentators on the proposal to make SOES mandatory were about equally divided between favoring and opposing the proposal. Some commentators believed that mandatory SOES participation might result in a widening of spreads by market makers to handle their increased risk from the automatic SOES executions. However, neither the commentators, NASD, nor SEC expected that SOES day trading firms would develop and that day traders would become the primary users of SOES.

Primary Users of SOES Are Day Traders

Shortly after market maker participation became mandatory, a few firms realized that they could profit from using SOES. NASD data show that these SOES day trading firms and their day traders became the primary users of

SOES. NASD officials have stated that the characteristics of SOES day traders are distinct from those of retail investors. They said that SOES day traders trade at the maximum allowable SOES transaction size, and that their trading volume is much higher than that of a typical retail investor. NASD data show that SOES day traders are also usually position-neutral—having neither a long (owning stock) nor a short (borrowing stock) position at the end of the day. Nasdaq reported that, as of September 1995, day traders accounted for about 83 percent of SOES share volume, 89 percent of the dollar volume, and about 69 percent of all SOES trades.

SOES day trading firm officials told us that day traders have several methods they use to buy and sell stocks. In addition to SOES, they may also use electronic communication networks (ECN), such as Instinet, or other Nasdaq order delivery systems such as SelectNet.[7] These officials said that day traders used ECNs in an attempt to negotiate prices that would offer them the highest profit when they closed out their positions. Until SEC instituted new trading rules in 1997, as discussed later, the prices in ECNs were not generally available to the investing public. Day traders accessed these systems through the SOES day trading firms. These firms also provided customized, proprietary software and various services, such as facilities and training, to assist the day traders that constituted their customers. The software systems included such features as real time quotes, news information, custom tickers that display market maker updates, charts of stock prices, and lists of the most active stocks.

SOES Provided a Trading Advantage for Day Traders

SOES day traders have had a trading advantage in the Nasdaq market over market makers and their customers because day traders can execute trades faster. Day traders execute trades immediately, through SOES, that market makers, with similar orders, would have to manually enter and possibly negotiate through SelectNet. Day traders' software systems have enabled them to take advantage of their immediate, automatic access to SOES by entering as many trades as they wanted, quickly cancel orders or enter multiple orders with an individual keystroke, and be notified about securities that reached predetermined prices. Conversely, market makers have not been able to use the day traders' techniques on SOES because

[7]ECNs are generally privately operated screen-based electronic trading systems that allow participants to enter priced orders that then are widely disseminated to third parties. Participants may include retail investors; mutual funds, pension funds, and other institutional investors; broker-dealers; and market makers. The sponsors of these systems are currently regulated by SEC as broker-dealers, even though the systems may operate differently from the activities of traditional broker-dealers. Instinet is a private trading system that is linked as an ECN to Nasdaq. SOES day trading firms, and their day traders, have access to Selectnet and Instinet because the firms, as NASD members, are allowed access to ECNs through their Nasdaq workstations.

Nasdaq rules until recently restricted market makers from entering SOES orders on behalf of their customers for stocks in which they make a market. In addition, market makers still cannot use SOES for their proprietary trades. The ability to execute trades faster than market makers has allowed SOES day traders to profit from short term price movements in stocks.

In addition, market makers told us that SOES day traders have an advantage over them because the day traders can get executions through SOES faster than the market makers can update their quotes. Specifically, market makers told us that the day traders initially used their advantage to profit at the expense of market makers that did not closely monitor their stocks. The SOES day trading firms provided day traders with software to monitor and identify market maker quotes that were "stale"—that is, as the prices of securities moved up and down, the market maker's quote may have been out of line with other market maker quotes for a short period of time. For example, one market maker who was not closely monitoring a particular stock may have left his bid and ask prices (the prices at which he is willing to buy or sell stock respectively) at $19.75 and $20, at the same time that other market makers moved their bid and ask quotes, because of some news on the stock, to $20.25 and $20.50. By taking advantage of their software that allowed them to identify this discrepancy, SOES traders could profit from the opportunity presented because they could automatically buy at $20 and then sell at $20.25. However, these opportunities became less frequent as market makers began to automate their quote monitoring.

At the time of our review, day traders generally used software provided by the SOES day trading firms to monitor a handful of stocks that had numerous intraday price movements, or to monitor many actively traded stocks, looking for trends to develop in order to buy in "up-trending" markets and sell in "down-trending" markets. They tried to buy stocks when they anticipated that prices would be increasing, selling later at higher prices; or similarly, selling stocks when they anticipated prices would fall and buying back later at lower prices—in either case profiting on the price momentum. According to market makers, one way day traders do this is to identify when institutional traders are buying or selling large amounts of a particular stock, and then buy or sell ahead of them. For example, assume an institutional trader wanted to buy 10,000 shares of a particular stock. If 10 market makers are each quoting prices for 1,000 shares, the trader's broker begins to purchase all the available shares at the quoted price through SelectNet. However, after purchasing 1,000 shares from each of two market makers, the broker finds that SOES day traders have purchased the rest of the shares through SOES, using the advantage provided by the automatic execution feature of SOES and their software that allows them to execute many orders at the same time. The SOES traders then sell the 8,000 shares to the broker at a higher price to the broker. According to market makers, this happens hundreds of times a day and causes institutional traders, as well as retail investors, to have to buy at higher prices and sell at lower prices because they do not have the same speed of access to the market as SOES day traders.

Market makers told us that they have established their own internal automated trading systems, which they use to fill retail investors' orders, and made software improvements in order to minimize their exposure to day traders. As a result of the improvements and changes in the trading rules, which we discuss later, the trading advantage that SOES day trading firms have had over market makers and their customers has decreased.

SOES Has Provided Access to Market Makers During Periods of High Trading Volume

Although regulators have had only two opportunities to observe SOES performance under periods of high trading volume, their analyses have shown that SOES provided investors placing small orders continued access to market makers throughout those periods. Only two periods of exceptionally high trading volume and volatility have occurred since June 1988 when SOES became mandatory—in October 1989 and October 1997.

On October 13 and 16, 1989, the securities markets experienced unusual price volatility and trading volume. On the 13th, the DJIA experienced a decline of 190 points—the second largest single-day point decline to that time. On the next trading day, the 16th, the DJIA closed up 88 points, the fourth largest point gain to that time.[8] SEC reported that market maker withdrawal from SOES participation during this period was significantly lower than in October 1987. SEC attributed this to the rule changes adopted the previous June, which made SOES participation mandatory and penalized withdrawals with a 20-day ban before reentry. SEC also found that SOES operated well and succeeded in handling its share of the third highest volume to that time on the Nasdaq Market. SEC concluded that, in part because SOES was able to handle the increased retail order flow, the Nasdaq Market operated much more effectively than in October 1987.

[8]The percentage decline, 6.9 percent, was only the 20th largest from 1900 through 1989, and the following day's percentage gain, 3.4 percent, was not among the top 20 largest gains during those years.

On October 27, 1997, the DJIA fell 550 points, 7.2 percent, the largest 1-day point drop in its history. The Nasdaq composite index fell by 7 percent, and trading volume was 906.4 million shares, well above the 1997 average daily volume of about 647.4 million shares. The next day, October 28, 1997, after trading resumed, the market rallied, and the Nasdaq index gained back much of what had been lost the previous day. That day, Nasdaq recorded trading volume of 1.3 billion shares—its first ever billion share day.

NASD's study of trading on October 27 and 28, 1997, found that SOES continued to provide investors efficient access to market makers on both days. SOES accounted for 6.9 percent of total Nasdaq share volume on Monday the 27th, which was similar to its use on previous days. The number of SOES orders entered on the 27th was about 114,000, which was well above the daily average for the previous week of about 83,000 orders. On Tuesday the 28th, SOES trading accounted for 6.4 percent of total Nasdaq share volume. On the 28th, the nearly 172,000 orders entered into SOES were more than twice the number entered on the average day. An NASD official told us that, while the SOES proportion of total Nasdaq volume did not rise, additional retail investor trading volume could have been executed through market makers' internal automated systems. Market makers established such in-house trading systems during the years between the 1989 and 1997 market breaks.

SEC has not completed its analysis of trading on October 27-28, 1997. However, SEC officials told us that they found no problems with small retail investors accessing the market during this 2-day period. According to the officials, SOES maintained its share of total trading over the period, which generally indicates that it allowed small orders to execute automatically against market maker quotes.

The volume of SOES trading has increased significantly since SOES began. According to NASD data, when SOES was introduced the system accounted for about 4,500 trades per day. In 1995, SOES accounted for over 40,000 trades a day, and by mid-October 1997, it accounted for about 83,000 trades a day. SOES share of the total Nasdaq market before 1995 was generally between 1 and 4 percent of total share volume. In 1995, SOES share of total volume increased to over 6 percent and remained at that level until, as discussed later, it declined after SEC and NASD rules' changes and increased use of ECNs.

Opinions Varied About the Effects of SOES Day Traders on the Market

Opinions varied about the effect of SOES trading on the Nasdaq Market. Market makers and SOES day trading firms disagreed about their respective roles in the market. They also disagreed about the effects of SOES day trading on spreads, liquidity, and volatility. Various studies did not help to resolve these disagreements because they did not clearly and precisely isolate the effects of SOES day trading from those of many other changes in the market, such as revised trading rules, that have occurred since SOES has been operating. Further, some market participants alleged that the nature of SOES day trading has allowed SOES to be used for price manipulation. Although regulators said they have found no indication that SOES has been put to such a use, they continue to examine for such issues.

Market Makers and SOES Day Trading Firms Disagreed About Their Roles in the Market

Market makers told us that they viewed day traders as sophisticated professional traders who are detrimental to the market because they profit at market makers' and others' expense. They said that SOES day trading not only has cost them money, but also has resulted in their institutional customers, such as pension funds and mutual funds, having to pay higher prices for securities because the day traders have an advantage in the market as described previously.

SOES day trading firm officials told us that day traders are small, individual investors trading for their own accounts. They said that day trading has benefited the market by forcing market makers to monitor and update their quotes and by increasing price competition. They said that, by taking advantage of "stale" market maker quotes, SOES day traders have forced market makers to improve their quote monitoring and revise their quotes immediately as the market changes, thereby improving the efficiency with which prices are determined. Further, they said that using SOES is the least expensive way for day traders to execute trades. For example, the maximum charge to execute a trade through SOES is $.50 for market makers and $.50 for order entry firms, whereas the charge to execute a trade through other trading systems can be as much as $15.

Disagreements About SOES Effects on Spreads

Market makers have indicated that SOES day trading has caused widened spreads, but SOES day trading firms disagreed. Since SOES was made mandatory, market makers stated their cost of doing business has increased as a result of SOES day trading, which has caused them to increase their spreads.[9] Market makers reported that they were initially

[9]Market makers earn their income off the spread between their buying and selling prices for stocks. Market makers have said that, to the extent that their costs rise, they raise their prices and widen their spreads.

unable to adequately monitor all the stocks in which they made a market, which increased the probability of stale quotes and thus the likelihood that they could lose money to SOES day traders. Additionally, they reported that the automatic execution feature had enabled SOES day traders to execute their orders before market makers could execute their customers' orders. Market makers have said that day traders' strategies have increased their costs of doing business, and that in order to cover these costs, they have widened their spreads. SOES day trading firm officials, however, said that day trader SOES activity causes market makers to monitor and update their quotes, benefiting everyone in the market. They also said that they often quote better prices than market makers when they do the trades to close out their positions, which results in a narrowing of spreads.

Studies that examined SOES effects on spreads have focused on whether SOES day trading actually widens spreads. The studies recognized that many factors, such as rule changes, affected spreads. However, during the periods covered by the studies, they were unable to isolate the effects of SOES from these other factors. One study found that the 1997 rule changes implemented in the Nasdaq Market had caused spreads to narrow while SOES day trading was occurring.[10] However, this study did not focus on measuring the effects of SOES. Another study found that adverse selection[11] attributed to SOES day trading had contributed to wider spreads.[12] Specifically, this study reported that market makers were, in essence, being forced to trade with SOES traders, who may have been better informed than other traders about which way prices would move. This may put market makers at a disadvantage and cause them to suffer an opportunity loss. Because market makers have an obligation to both buy and sell stock, they may be buying at higher prices when they need to buy, and selling at lower prices when they need to sell, because of SOES traders' activities. Their opportunity loss is the difference between the prices at which they actually bought and sold and those at which they could have bought and sold without the temporary price effects of the SOES activity. The study attempted to measure the market makers' losses caused by this

[10]Michael J. Barclay, William G. Christie, Jeffrey H. Harris, Eugene Kandel and Paul H. Schultz, Nasdaq Market Reform: New Evidence that Competition from the Public Lowers Trading Costs, Working Paper 97-10, July 1, 1997.

[11]Adverse selection is a term taken from the field of insurance analysis. It describes a tendency for poorer risks to seek or continue coverage to a greater extent than do better risks. Adverse selection leads to higher costs for insurers and to attempts by insurers to put restrictions on policies. In securities markets, the parallel is that some participants are better informed than others. Market makers prefer to negotiate prices as a way of determining how well informed traders are and to reduce adverse selection costs.

[12]George Benston and Robert A. Wood, Day Trading on Nasdaq's Automatic Small Order Execution System (SOES): Adverse Selection and Spread, Unpublished, 1997.

adverse selection, and concluded that market makers increased their spreads to offset these losses. Measuring adverse selection is always very difficult because it relies on measuring differences in information that are not observable. As a result, it is not clear that the study accurately measured the opportunity losses resulting from adverse selection. In addition, the study did not isolate or control for the influences of other factors that could have affected prices, such as rule changes. Because the study did not control for these other factors, the study may not have accurately measured the effects of adverse selection.

Disagreements About SOES Effects on Liquidity

Market makers said that they have reduced the number of stocks in which they make markets, in part because of SOES. They said that they did this because their costs increased due to SOES day trader activity. The more stocks they covered, the more likely they were to have stale quotes, which in turn attracted SOES day traders. They said that the reduction has resulted in less liquidity in the market because they are putting up less capital in total than formerly, and because they are offering to buy or sell smaller amounts of the stocks in which they make a market. Furthermore, they stated that the cost of liquidity may have risen because their retail and institutional customers cannot purchase as much of a stock at a given price as they could before SOES.

SOES day trading firms said that, for the most part, day trading has not caused a reduction in liquidity. They stated that, because they are purchasing and selling securities at the market maker's spread, and doing so frequently, they are not only providing the market maker with increased profits, but are also putting their capital at risk, thereby providing liquidity to the market. Market participants have also said that other market making firms have started making markets in those stocks that had experienced an initial reduction of market maker activity, thereby continuing to provide liquidity to the market.

Some studies concluded that SOES day trading had caused market makers to make markets in fewer stocks. For instance, NASD looked at the stocks whose number of market makers had declined since SOES was made mandatory, and found that the stocks with higher levels of SOES activity were the ones with the largest decline in market maker participation.[13] While acknowledging that SOES day trading has affected market maker activity in some stocks, the approaches taken by the studies did not often

[13]Nasdaq Economic Research (Dean Furbush, D. Timothy McCormick, Kathleen L. Mitchel, Lorraine M. Reilly, James P. Selway III, and Michael P. Watson), “SOES and the Nasdaq Stock Market,” Unpublished, November 29, 1995.

take into account other factors, such as rule changes, profitability, or market conditions, that may contribute to fewer market makers in stocks. Additionally, it was difficult to determine from the studies whether market makers would continue to make markets in fewer stocks in the long run.

Disagreements About SOES Effects on Volatility

Market makers and other market participants said that SOES day trading has caused increased volatility in the market. They stated that the trading strategies of SOES day traders, such as the momentum based strategy of buying in "up trending" markets and selling in "down trending" markets, has led to increased volatility. Conversely, SOES day trading firms said that volatility has been the result of market forces, not SOES trading.

Some of the studies examining volatility showed that SOES day trading and volatility were correlated. However, the studies did not clearly establish whether SOES day trading caused volatility or whether other market factors caused volatility, which then attracted SOES day trading. Some studies found that significant SOES trading occurred on days with large price changes in stocks, and concluded that SOES day trading causes volatility. One study, which assessed the behavior of quotes where clusters of maximum-sized SOES trades occurred, found that price volatility and SOES activity were correlated. Another study, which attempted to determine whether increased volatility had attracted SOES trading or whether SOES trading caused volatility, found a correlation between instances of high volatility and periods in which a large portion of trades were SOES trades. The study concluded that large volumes of SOES trading caused increased volatility in the short run, but contributed to lower volatility in the long run.[14] Other studies also indicated that SOES day trading actually concentrated the price discovery process by moving prices to their equilibrium faster than would have happened in the absence of such trading.

Some Market Participants Said That, by Its Nature, Day Trading Has Resulted in Price Manipulation

Some market participants said that, by its nature, day trading has resulted in the manipulation of some stocks' prices. These participants stated that, although SOES may not be the cause of price manipulation, the nature of day trading, especially momentum-based trading, can assist those who want to manipulate stock prices. For example, they said that stock manipulators can momentarily quote prices for stocks that trigger SOES momentum trading by putting prices into an ECN, and then cancelling the

[14]Robert H.Battalio, Brian Hatch, and Robert Jennings, "SOES Trading and Market Volatility," Journal of Financial and Quantitative Analysis, Vol. 32, No. 2 (June 1997).

quote before a trade occurs. They have pointed to specific stocks that have incurred certain "spikes" in their prices over short periods of time concurrent with periods of large volumes of SOES day trading. They have further stated that no logical reason existed for the rapid increases in the prices of the stocks other than the likelihood that the stock prices were being manipulated.

Both NASD and SEC officials that we talked to said that they have investigated the allegations of price manipulation and have not found that SOES was being used for such purposes, but that their investigations are continuing. NASD officials said that, in most of the cases evaluated thus far, the increase in SOES volume was attributable to investors' natural reactions to news and other information in the marketplace that would affect price levels. They further stated that, while SOES volume and price volatility were correlated in certain stocks, the correlation does not support allegations that the stocks were manipulated through SOES. We plan to review this issue in more detail during future work.

Attempts to Limit SOES Day Trading or Replace SOES

After NASD and Nasdaq market makers became concerned about day traders use of SOES, NASD proposed various SOES rule changes to limit the activity of the day traders. SEC approved these rule changes, but SOES day traders contested one of these changes in federal court. The court's decision and the outcomes of two federal investigations of the competitiveness of the Nasdaq Market served to bolster the case for automated trade execution in that market. SEC did not act on two later NASD attempts to replace SOES with other systems that did not feature immediate automatic execution of small orders because of (1) technical concerns about the systems' operations, (2) market participant opposition, and (3) lack of provisions for the execution of small orders without market maker intervention. A chronology of SOES and SOES-related events can be found in appendix I.

NASD Changed Its Rules to Limit SOES Day Trading

Not long after SOES became mandatory, market makers complained to NASD that SOES day trading firms were using SOES to execute orders for day traders, which was not its purpose. In response, NASD proposed several rule changes to limit SOES day trading activity. These changes are summarized below and discussed in more detail in appendix I.

- An August 1988 rule change prohibited SOES users from "order splitting"—that is, dividing orders they received that were larger than the

SOES maximum order size into smaller parts so that they could be entered into SOES.

- A December 1988 rule change prohibited entering orders into SOES on behalf of a professional trading account (PTA). A PTA was defined to include any account in which five or more day trades had been executed through SOES during any trading day or where a professional trading pattern in SOES was demonstrated. The rule defined “day trade” or “day trading” to mean the execution of offsetting trades in the same security for generally the same size during the same trading day.
- An October 1991 rule change set criteria for NASD to designate a trading account a PTA. The criteria included excessive frequency of short-term trading, excessive frequency of short-sale transactions, existence of discretion, and direct or physical access to SOES execution capability.[15] The rule change expanded the definition of a “day trade” by eliminating the restriction that both sides of a trade must be executed through SOES to be considered a day trade.
- A second October 1991 rule change allowed market makers a 15-second delay to update a quotation before being obliged to execute a second similar order in the same security through SOES. This rule change also allowed market makers to decline preferencing by SOES order entry firms.[16]
- The December 1993 rule changes, which are known as “Interim SOES Rules,” further attempted to restrict day traders’ use of SOES.[17] Approved on a 1-year pilot basis, the rule changes (1) reduced the maximum size order eligible for SOES execution from 1,000 shares to 500 shares, (2) reduced the minimum exposure limit from 5 times to 2 times the maximum order size, (3) allowed market makers to voluntarily use a new Nasdaq system feature that automatically updates quotations once the market makers’ exposure limit has been exhausted, and (4) prohibited short-sale transactions through SOES.

SEC approved all these rule changes. As a former SEC official told us, SEC’s sympathy toward the market makers’ position was understandable in view of the fact that SEC encouraged NASD, following the 1987 market crash, to make SOES participation mandatory for market makers. SEC officials told us that SEC approved NASD’s rule filings until SEC’s investigation of NASD showed NASD’s abusive behavior toward day traders and the illegal pricing

[15]A short sale is the sale of a security that is not owned by the seller to take advantage of an anticipated decline in the price of the security.

[16]SOES allows preferencing of orders in which the orders are designated to be sent to a particular market maker.

[17]The rules were considered interim in anticipation of NASD’s designing a system to replace SOES.

convention among Nasdaq market makers that SEC reported in its 21(a) report.

Other Events Further Bolstered SOES Day Trading

While NASD and SEC were attempting to limit the activities of SOES day traders, a series of events occurred during the period 1993 through 1996 that helped further legitimize and bolster the position of SOES day traders in the market. A lawsuit filed against SEC by SOES day traders contesting its approval of the PTA definition, a Department of Justice investigation of the practices of certain Nasdaq market makers and Nasdaq's market structure, and SEC's own investigation of NASD and the Nasdaq Market—together caused SEC to become more skeptical of Nasdaq market makers' views and increased SEC scrutiny of NASD rule proposals affecting SOES.

Court Decision Favored Day Traders

In 1991, shortly after SEC's approval of NASD's rule expanding the definition of a PTA, William Timpinaro, a SOES trader, and others filed a petition with the U.S. Court of Appeals for the District of Columbia Circuit. The lawsuit sought the court's review of SEC's rule approval decision.[18]

In August 1993, the court remanded the case to SEC to provide further support for its assertions that failure to restrict professional traders from SOES would cause market makers to cease making markets or widen spreads. In addition, the court found the definition of a PTA unconstitutionally vague and subject, in part, to open interpretation, and therefore asked SEC to address the vagueness of the definition.

In response to the decision, NASD withdrew the PTA rules. According to SEC officials, the Timpinaro case showed that SEC decisions on SOES rule changes were likely to be litigated, which caused SEC to be more cautious about the actions it considered to resolve problems surrounding SOES.

Antitrust Investigation Found Market Makers' Conduct Anticompetitive

In October 1994, the Department of Justice's (DOJ) Antitrust Division started a broad review of Nasdaq's market structure. DOJ started its review following (1) reports in the media about an academic study on spreads on the Nasdaq Market and related market maker behavior[19] and (2) a class

[18]Timpinaro v. SEC, 2 F.3d 453 (D.C. Cir. 1993).

[19]The study was actually published in December 1994. William G. Christie and Paul H. Schultz, "Why Do Nasdaq Market Makers Avoid Odd-Eighth Quotes?" Journal of Finance, 49 (Dec. 1994), pp. 1813-1840.

action antitrust complaint filed by Nasdaq investors against various Nasdaq market makers.[20]

DOJ's review resulted in a July 17, 1996, civil action. DOJ alleged that the market makers adhered to and enforced a pricing convention that was designed to and did deter price competition among the market makers in their trading of stocks with the public. It also stated that the illegal pricing convention resulted in investors incurring higher transactions costs than if the market makers had not acted to restrain competition.

On that same day, the defendants and DOJ filed a proposed order to settle the complaint and resolve the allegations. The order sought to eliminate the anticompetitive conduct and establish procedures to ensure that such conduct did not recur. Specifically, the market makers were to refrain from adhering to the pricing convention regarding their actions to fix, raise, lower, or maintain prices or quotes for Nasdaq securities. The order also required each defendant firm to adopt an antitrust compliance program and designate an antitrust compliance officer. The officer is required to monitor and tape record certain telephone conversations between stock traders and report any instances of noncompliance with the order to DOJ. Although approved by the District Court, the settlement has been stayed pending appeal. On August 6, 1998, the appeals court affirmed the district court's approval of the settlement.

SEC's Investigation Revealed Market Maker Abuses

In August 1996, SEC settled its investigation with NASD. In the 21(a) report on the investigation, SEC found that Nasdaq market makers adhered to a pricing convention that often increased transaction costs paid by customers. The pricing convention particularly affected small orders, such as those transacted over SOES. SEC also found failure to honor price quotations and trade reporting violations among Nasdaq market makers. NASD was also found lax in prosecuting rule violations by market makers, while it focused enforcement efforts on the activities of SOES day trading firms.

According to SEC officials, the investigation caused SEC to change its views regarding SOES. As noted in SEC's report, the evidence of the pricing convention and other anticompetitive behavior of market makers provided SEC ample reason to doubt that SOES traders were to blame for the width of the spreads in the Nasdaq Market. In settling the matter, NASD consented to

[20]In December 1997, the parties reached a proposed settlement, which the court has yet to approve. The 30 market makers involved agreed to pay a total settlement of $1.01 billion.

SEC's findings and sanctions and agreed to undertake actions to eliminate any pricing conventions and detect and punish anticompetitive behavior.

Attempts to Replace SOES Have Failed to Win SEC Approval

NASD has twice tried to replace SOES with alternative systems. In March 1994, NASD proposed a system called N*Prove. N*Prove was designed to replace SOES, and its immediate automatic trade executions, with a system that would give market makers 15 seconds to decline an incoming order before the order would be executed. N*Prove included a limit order file that provided the opportunity for some customer orders to interact with each other without market maker intervention. SEC was concerned that such a system could result in a queuing of orders, insufficient opportunities for customer interaction without the intervention of a market maker, and inadequate enforcement of NASD's firm quote rule. NASD withdrew the N*Prove proposal without formal action by SEC.

Late in 1995, NASD proposed to replace SOES with NAqcess. Like N*Prove, NAqcess was to be an order delivery system and provided a limit order file, but it was modified to resolve problems posed by N*Prove. NAqcess would provide for automatic execution of a customer's order after it was displayed for 20 seconds, and if the market maker did not decline the order. To lessen the queuing problem associated with N*Prove, NAqcess would have routed orders to market makers with the best quotes in priority order, at 1-second intervals. Orders declined would be re-presented to available market makers.

SEC received more than 1,000 comment letters, and NAqcess was never approved. SEC officials told us that many commentators, including institutional investors, opposed NAqcess. Day traders opposed NAqcess because it would have eliminated the SOES immediate automated execution feature and given market makers the opportunity to decline trades. The commentators noted the anticompetitive behavior and backing-away violations of market makers revealed by SEC's 21(a) investigation. SEC officials said that SEC asked NASD to address the commentators' concerns. They said NASD could not resolve the concerns and withdrew the proposal.

Recent Market Developments and Proposals Affecting SOES

In January 1997, NASD implemented SEC's order handling rules and began an actual size pilot program. On July 15, 1998, SEC approved a rule allowing market makers to quote actual size for all stocks. Also, in June 1997, NASD implemented a rule change that decreased the minimum quotation increment allowed from 1/8th to 1/16th of a dollar. Analyses by NASD and others show that these changes have decreased spreads and have been associated with a reduction in SOES' share of Nasdaq trading volume. In March 1998, NASD proposed replacing SOES with a new system that would make automatic trade executions more widely available to market participants and that would limit the unintended double execution liability incurred by market makers. While most market participants agree with this proposal, some of its provisions are controversial.

New Rules Have Lessened SOES Activity

SEC's order handling rules became effective first for actively traded, then later for all, Nasdaq securities. The order handling rules required Nasdaq market makers to display customer limit orders and to disseminate the best prices placed by market makers in ECNs, which previously were not included in the Nasdaq Market. SEC intended these rules to make the Nasdaq Market a more competitive, customer order-driven market and thus reduce bid-ask spreads.

A follow-up NASD study showed that spreads for the first 150 stocks that became subject to the rules narrowed by about 33 percent.[21] Another study found that, for the first 100 stocks phased in between January 20, 1997, and February 10, 1997, spreads narrowed by over 35 percent.[22] The study also showed that the proportion of share volume traded through SOES fell by 6 percentage points for the first 50 stocks subject to the rule changes. As spreads become narrower, the ability of SOES day traders to earn a profit on a trade of a given size, such as 1,000 shares, may be lessened.

Starting in January 1997, NASD also implemented an actual size pilot program. This program allowed market makers to display quotes in minimum sizes of 100 shares for 50 stocks, then later for another 100 stocks. NASD indicated that allowing actual size quotes in conjunction with the requirement to display limit orders would narrow spreads. NASD's initial, June 1997, study showed a reduction in the average spread of about 33 percent when the same stocks were compared before and after the pilot began. However, the reduction in spreads was about the same for both pilot and nonpilot stocks, indicating that the pilot had no significant effect on spreads. A second study of 103 stocks brought into the pilot in November 1997 also showed the same result. As discussed previously, on

[21] NASD Economic Research Department, Effects of the Removal of Minimum Sizes for Proprietary Quotes in The Nasdaq Stock Market, Inc., Unpublished, June 4, 1997.

[22] Michael J. Barclay, William G. Christie, Jeffrey H. Harris, Eugene Kandel, and Paul H. Schultz, The Costs of Trading Nasdaq Issues: The Impact of Limit Orders and ECN Quotes, The Charles A. Dice Center for Research in Financial Economics, Fisher College of Business, The Ohio State University (July 1, 1997).

July 15, 1998, SEC approved a rule to permanently allow market makers to display actual size quotations for all Nasdaq securities.

Data in the NASD studies indicated that actual size quotations reduced SOES market share of Nasdaq volume. Data in the first study showed that SOES market share declined by only about 2.9 percent for nonpilot stocks, but declined by about 17.3 percent for pilot stocks. Data in the second study showed SOES market share to have declined by 19.5 percent for nonpilot stocks and 26.7 percent for pilot stocks. However, NASD further analyzed these data to control for differences in price, volume, and interday volatility, and concluded that actual size quotations had little effect on SOES market share.

In May 1997, SEC approved a NASD proposed rule, which became operational early in June. The rule decreased the minimum quotation increment from 1/8th to 1/16th of a dollar for securities with a bid price greater than or equal to $10. The change was intended, among other things, to provide investors with a greater opportunity to receive better prices when they buy or sell stocks. NASD's preliminary analysis showed that the decrease in the quotation increment resulted in a decrease in the quoted spread for stocks subject to SEC's order handling rules.

Before these changes were made, in January 1997, SOES trading accounted for 12.9 percent of the total dollar volume of Nasdaq trading and 7.7 percent of total share volume. About 1 year later, in February 1998, SOES trading accounted for 6.8 percent of total dollar volume and 4.6 percent of total share volume. According to a NASD official, part of this reduction could also be attributed to increased use of ECNs; market makers' internal automated trading systems; and software improvements for SelectNet, Nasdaq's automated order entry and delivery system. Officials of SOES day trading firms told us that they have developed ECNs to allow their day traders, and other investors, more direct access to the market than that provided by SOES.

Proposed System Would Make Automatic Execution Available to All Traders

In March 1998, SEC published for comment a NASD proposal to establish a new Integrated Order Delivery and Execution System. The system would replace SOES and SelectNet and would provide an integrated order routing and execution system and a voluntary limit order file. The proposed system would provide investors and traders, including market makers, immediate and automatic executions for their orders in strict time priority (on a first-come, first-served basis). As proposed, with the approval of the actual size rule, the new system permits market participants to enter orders up to 999,999 shares.

The proposed system would allow market makers to turn the system off momentarily to prevent having trades executed against them while they are handling telephone orders. Orders of greater than 1,000, but less than 5,000, shares are to be presented to market makers or ECNs for 17 seconds, with the options of accepting, declining, or doing nothing. If nothing is done, the order will default to an execution at the displayed quote amount. Orders of 5,000 shares or more are to be presented to market makers for review for 32 seconds and then, if not acted on, will also default to an execution. Market makers and ECNs would only have to honor one execution at the quoted size and then, depending on the order size, would have 17 or 32 seconds to update quotes. The proposed system, with the approval of the actual size rule, would allow proprietary orders of any NASD member, both market makers and non-market makers, to be entered.

SEC has received about 2,100 comment letters on this proposal. The commentators generally have favored adoption of the new system. However, commentators representing SOES day trading firms and day traders have opposed the feature that allowed market makers to shut off the system while taking telephone orders. They also opposed the 17- and 32-second delays in which market makers could choose to decline orders of more than 1,000 and 5,000 shares, respectively. They said that the shutoff feature and time delays were inconsistent with NASD's Firm Quote Rule. Other commentators, representing investment bankers and broker-dealers, opposed the system's limit order file. They said that the limit order file, which would allow orders to be executed without market maker intervention, would provide NASD an unfair advantage over its member firms that also provide limit order services.[23] Finally, some large market makers and Nasdaq-listed companies favored adoption of the system without any changes.

As published, the system proposal does not contain any analytical justification of the share sizes at which the time delays would become operational. Time delays allow market makers to delay the execution of trades, which reduces market efficiency. However, time delays may be appropriate to protect market makers from unlimited automatic trade executions at a given price. If time delays are appropriate, the actual experience of market makers regarding share sizes that are typically negotiated may provide a basis for determining the share size limits. For

[23]The limit order file would result in Nasdaq's competing with market makers to execute these orders.

example, the six market makers we interviewed about their operations told us that they had in-house automated execution systems. One market maker said that 95 percent of its trades are executed using its internal automated system. Another said that its customers can obtain automatic executions through its internal automated system for orders of up to 2,000 shares.

Conclusions

The use of SOES primarily by day traders was an unintended consequence of mandatory market maker participation in SOES. Small retail trades, which were expected to be done through SOES, instead are being done to a large extent through market makers' internal automated systems developed after SOES day traders became active. These systems have provided market makers' small retail customers the same kind of immediate, automatic trade executions available through SOES, even during periods of unusually high trading volume and volatility such as occurred during October 1989 and October 1997. However, they are not mandatory, and no major market disruptions on the order of October 1987 have occurred during this period to test whether market makers' internal systems would continue to provide immediate, automatic executions during such a crisis.

Despite its unintended consequence, SOES has benefited the market by providing efficient execution of securities transactions at the best bid and ask prices and allowing investor orders to be executed without manual market maker intervention. These results are consistent with national market system goals. In addition, the SOES automatic execution feature provides market discipline for market makers and ensures access to the market for small investors in times of market stress. We did not come to any definitive conclusions about SOES day trading's effects on spreads, liquidity, or price volatility in the Nasdaq Market because the various studies and our discussions with market makers and SOES day trading firm officials could not separate the effects of SOES trading from those of other market changes.

SOES day traders' ability to access Nasdaq quotes and trade faster through SOES than market makers and their customers could trade through other systems has provided them an advantage that they have used to profit at the expense of market makers and their customers. Allowing one market segment such a continuing advantage over others is contrary to the goal of fair competition among market participants. However, the day traders' advantage from their use of SOES has become less of a factor in the market over time, as market makers have improved systems to address the effects of automated trading and regulators have adjusted market rules. SOES day trading may be further affected by (1) the 1997 order handling rules that have provided all market participants, including day traders, more direct access to the best available prices through ECNs than is available through SOES, and (2) the 1998 actual size rule that reduces market maker exposure to day traders if the market makers choose to reduce their quotation sizes.

Nasdaq, SEC, and affected market participants have been unable to agree on a new system to replace SOES that would retain the benefits of automatic execution. The latest Nasdaq proposal to replace SOES and SelectNet with an integrated system is intended to do both. However, it could establish delays for the execution of some trades that may hinder market efficiency. Such delays could also disrupt the market discipline provided by the immediate, automatic execution of retail orders. Determining a share size at which time delays may be appropriate for market makers could be done by analyzing their experience regarding share sizes that are typically negotiated, and by better documenting the size of orders most often submitted by retail investors.

Recommendations

We recommend that the Chairman, SEC, ensure that any trading system approved to replace the current Nasdaq trading systems be designed to correct the trading advantage available to SOES day traders and provide for the immediate, automatic execution of investors' small orders at the best possible prices. We also recommend that the Chairman, SEC, require Nasdaq to provide adequate data analysis to support aspects of the system that may affect market efficiency and discipline. For example, such analysis should be used to determine the appropriate share size at which time delays would be allowed in the proposed Integrated Order Delivery and Execution System.

Agency Comments and Our Evaluation

NASD and SEC provided written comments on a draft of this report. (See apps. II and III.) Both NASD and SEC recognized that the issues the report addresses are complex and that the parties involved have a vested interest and often widely divergent views on how SOES should operate. NASD commented that the report provides a balanced and accurate description of the issues. While SEC generally agreed with the report's conclusions and recommendations, it took exception to our conclusion that SOES day traders currently enjoy an advantage over other market participants, which SEC referred to as an "unfair advantage." We continue to believe that

SOES day trader's ability to access Nasdaq quotes and trade faster through SOES than market makers and their customers could trade through other systems has provided day traders an advantage that they have used to profit at the expense of market makers and their customers. We also found that while this advantage exists, it has diminished over time and become less of a factor in the market as market makers have improved systems to address the effects of automated trading and regulators have adjusted market rules.

Separately, we made technical corrections to the draft as suggested by both agencies.

We will provide copies of this report to the Chairman and Ranking Minority Members of the House Commerce Committee, SEC, NASD, and other interested committees and organizations. Copies will be made available to others on request.

Major contributors to this report are listed in appendix IV. Please call me on (202) 512-8678 if you or your staff have any questions about the report.

Richard J. Hillman

Richard J. Hillman
Associate Director, Financial Institutions
and Markets Issues

Contents

Abbreviations

DJIA	Dow Jones Industrial Average
DOJ	Department of Justice
ECN	Electronic Communication Network
NASD	National Association of Securities Dealers
PTA	Professional Trading Account
SEC	Securities and Exchange Commission
SOES	Small Order Execution System

Chronology of SOES and SOES-Related Events

February 1985

SEC approves proposed NASD rule change for implementation of SOES. NASD created SOES to provide an economical and efficient system to route and execute small retail agency orders, initially 500 shares, of Nasdaq securities. Use of SOES by NASD members was to be voluntary.

June 1988

SEC approves NASD proposed rule change to make SOES participation mandatory for all market makers in Nasdaq national market securities. The change was intended to ensure investors access to the Nasdaq market after investors experienced problems in attempting to access the market during the high volume trading of the week of October 19, 1987. (We found that market makers had withdrawn from SOES and from making markets.[24]) The change was expected to facilitate the automatic execution of customers' small orders without the need for telephone contact between order entry and executing firms. The proposal established maximum order size limits of 200, 500, and 1,000 shares, depending on the trading characteristics of different securities.

August 1988

SOES rules are amended so that agency orders no larger than the maximum order size received from public customers may be entered by a SOES order entry firm and orders in excess of the maximum size may not be divided into smaller parts to meet the size requirements ("order splitting"). The change was made in response to market maker complaints of rapid-fire executions against their quotes by SOES day traders.

December 1988

SEC approves NASD SOES rules changes to prohibit members from entering SOES orders on behalf of Professional Trading Accounts (PTA). A PTA was defined to include any account in which five or more day trades had been executed through SOES during any trading day or where a professional trading pattern in SOES is demonstrated. The rule defined "day trade" or "day trading" to mean the execution of offsetting trades in the same security for generally the same size during the same trading day. Professional day traders were using SOES automatic executions to take advantage of slight disparities in market maker quotes arising from market makers' being slow to update quotes in response to market news. SEC favored the rule change because it was concerned that the SOES participation requirements, combined with the presence of professional day traders in the market, posed risks that would cause market makers to

[24] Financial Markets: Preliminary Observations on the October 1987 Crash (GAO/GGD-88-38, Jan. 26, 1988).

eliminate their market maker positions in stocks, thereby reducing liquidity in the market.

August 1990

SEC approves SOES rules change to prohibit market makers from entering agency orders into SOES in securities in which they make markets. This change was intended to prevent market makers from executing customer orders they have received against their competitors, using SOES.

November 1990

SEC approves SOES rules change to provide SOES capability for entering and storing limit orders.

October 1991

SEC approves SOES rules change to allow market makers to (1) use a 15-second delay to update quotes after receiving a SOES execution and (2) indicate order entry firms from which they will accept preferenced orders.

SEC approves SOES rules change to expand the definition of a PTA by eliminating a requirement that both sides of a trade must be executed through SOES for it to be considered a day trade. The change set forth criteria for NASD to designate a trading account a PTA, including excessive frequency of short-term trading, excessive frequency of short-sale transactions, existence of discretion, and direct or physical access to SOES execution capability. The rule change also expanded the definition of a "day trade" by eliminating the requirement that both sides of a trade must be executed through SOES for it to be considered a day trade. NASD believed these changes were necessary to curtail professional day traders' use of SOES to "pick off" market makers with quote discrepancies. NASD regarded the day trading as an abuse of SOES, for which the system was not created. NASD and certain members thought that SOES day trading exacerbated market volatility, created wider spreads, and resulted in a loss of liquidity for individual and institutional investor orders. SEC expressed concern that the presence of day traders could result in a widespread reduction in market making and have a significant negative impact on market liquidity.

William Timpinaro et al. file a petition for review of the SEC approval orders with the U.S. Court of Appeals for the District of Columbia District.

April 1993

SEC responds to questions submitted to it by the Court of Appeals concerning the interrelationship of the Firm Quote Rule with the PTA and 15-Second Rules.

November 1993

The Court of Appeals remands the PTA Rules back to SEC for it to provide further explanations of the professional trader rule and to consider whether the rules were unacceptably vague.

December 1993

NASD withdraws the PTA rules because they did not prove effective in limiting the use of SOES, thus eliminating restrictions enacted by those rules and the associated definitions of day trading and day traders.

SEC approves rule change, called “Interim SOES Rules,” to allow a 1-year pilot that provided for (1) a reduction in the SOES maximum order size from 1,000 to 500 shares, (2) a reduction in the exposure limit from 5 times to 2 times the maximum order size, (3) an automated function to update market makers quotations once the exposure limit is exhausted, and (4) prohibition of short sales through SOES. The changes were expected to reduce the effects that active trading through SOES had on market maker risk and SOES participation. NASD stated that it proposed these rules to take the place of the withdrawn PTA rules in an attempt to “limit the types of transactions that may be executed through SOES and thereby limit the use of SOES by those who use it in a manner inconsistent with the intended use of SOES.” SEC believed that SOES day trading imposed increased risks and costs on Nasdaq market makers, which caused them to widen spreads and might cause them to withdraw from making markets. SEC further reasoned that these costs outweighed any momentary increases in liquidity and marginal increases in price discovery that day trading contributed to the market. Since December 1993, items (1) and (3) of the Interim Rules have been periodically extended pending the time when a system to replace SOES is adopted. Item (2) was extended through January 1997 when the exposure limit went down one times the maximum order size. Item (4) was extended until February 1995.

March 1994

NASD files with SEC a proposal for a system called N*Prove. N*Prove was designed to replace the SOES immediate automatic execution system with an order delivery system that would have given Nasdaq market makers 15 seconds to decline incoming small orders, rather than have the orders automatically executed against them. The N*Prove proposal also included a limit order file that would have provided the opportunity for some customer orders to interact with each other. N*Prove was to route orders to market makers on a rotating basis, depending on their priority ranking in the Nasdaq quote montage.

October 1994	DOJ Antitrust Division announces that it is undertaking a broad review of a number of aspects of Nasdaq's market structure.
December 1994	NASD responds to an SEC staff request to provide an assessment of the potential for order queues to develop under a system proposed to replace SOES, called N*Prove. N*Prove would route orders, on a rotating and priority basis, to individual Nasdaq market makers for automated execution, unless the market maker declined the order.
February 1995	SEC approves extension of the Interim SOES Rules through March 27, 1995, except that the prohibition on short sales was not extended because of the acceptance of a broader Nasdaq short-sale rule.
March 1995	SEC approves extension of Interim SOES Rules through October 2, 1995, except that the change in the maximum order from 1,000 to 500 shares was not extended because the available data demonstrated no significant improvement or detriment at either share amount.
October 1995	SEC approves extension of Interim SOES Rules through January 31, 1996.
December 1995	SEC publishes, to solicit comments, a proposed NASD rule change that would replace SOES with NAqcess. NAqcess would provide for automatic execution of customers' orders after they are displayed for 20 seconds and the market maker does not decline the order. Orders could only be declined if another order was just executed and the market maker is updating quotations. NAqcess also provided for a limit order file against which order would be automatically executed. According to SEC officials, SEC received over 1,000 comment letters, and NASD withdrew the NAqcess proposal.
February 1996	SEC approves extension of Interim SOES Rules through July 31, 1996.

July 1996

SEC approves extension of Interim SOES Rules through July 31, 1997.

DOJ files a civil action complaint re: United States v. Alex Brown & Sons, et al. (S.D.N.Y.) pursuant to Section 4 of the Sherman Act, as amended, 15 U.S.C. section 4 seeking equitable and other relief to prevent and restrain violations. DOJ alleged that the defendants and others adhered to and enforced a "quoting convention" that was designed to, and did, deter price competition.

Defendants of United States v. Alex Brown & Sons, et al. and DOJ file a proposed Stipulation and Order to resolve the allegations of the DOJ complaint. The order would eliminate the anticompetitive conduct and establish procedures to ensure that such conduct did not recur.

August 1996

SEC completes its investigation of the Nasdaq Market. In the investigation report, the 21(a) report, SEC found that Nasdaq Market makers adhered to a pricing convention that often increased transaction costs paid by customers. The pricing convention particularly affected small orders, such as those transacted over SOES, which are executed at the best available bid and ask prices. SEC also found that NASD had harassed SOES day trading firms. Further, it found that NASD had been lax in its enforcement of extensive trade reporting and failure to honor quotation (backing away) violations by Nasdaq market makers. In its settlement, NASD agreed to take actions to eliminate any pricing conventions and detect and punish anticompetitive behavior.

January 1997

SEC approves extension of Interim SOES Rules through July 31, 1997.

SEC approves SOES rule change that would establish a 5-second grace period between SOES executions in locked and crossed markets. A locked market occurs when one market maker's quoted bid price for a security equals another market maker's ask price. A crossed market occurs when one market maker's quoted bid price is greater than another market maker's ask price. The change was intended to continue to provide incentive to market makers to update quotes and enhance market makers' ability to react to SOES transactions in locked and crossed markets.

SEC's order handling rules become effective for actively traded, then all, Nasdaq securities. The order handling rules required Nasdaq market makers to display customer limit orders and to disseminate the best prices placed by market makers in ECNs. A follow-up NASD study showed that spreads had narrowed by 33 percent. Another study by economists Barclay, Christie, Harris, Kandel, and Schultz found that, for the affected stocks, spreads narrowed by over 35 percent, and the proportion of share volume traded through SOES fell by 6 percentage points, as a result of the rule changes.

SOES rule changes become effective with the order handling rules. Notable among the changes are (1) a market maker's displayed quotation size is to constitute the minimum exposure limit that the market maker is obligated to execute and (2) market makers are allowed to enter all customer orders into SOES, including those for stocks in which they make a market.

NASD implements an actual size pilot program that allowed market makers to display quotes in minimum sizes of 100 shares for 50 stocks (then later another 100 stocks) being phased in under the order handling rules. NASD stated that allowing actual size quotes in conjunction with the requirement to display limit orders would narrow spreads.

April 1997

The federal district court granted the Stipulation and Order filed in United States v. Alex Brown & Sons et al., 963 F. Supp. 235 (S.D.N.Y. 1997).

May 1997

SEC approves a NASD rule change to decrease the minimum quotation increment for securities with a bid price greater than or equal to $10 that are listed and traded on the Nasdaq Stock Market to 1/16th of $1.00. The change was intended to enhance the transparency of the Nasdaq Market, provide investors with a greater opportunity to receive better execution prices, facilitate greater quote competition, promote the price discovery process, contribute to narrower spreads, and enhance the capital formation process. NASD's preliminary analysis showed that the decrease in the quotation increment resulted in a decrease in quoted spread for stocks subject to SEC's order handling rules.

December 1997

SEC approves a NASD rule change regarding (1)excused withdrawals of market makers from participation as market makers in Nasdaq national market securities and (2)reinstatements of market makers who fail to reenter quotes after their quote sizes have been decremented through SOES trading. The rule change listed specific factors for which market makers can be excused or reinstated.

SEC approves a NASD rule change to indicate that, once SOES executes an unpreferenced market order or marketable limit order against a SOES market maker, that market maker is not required to execute another unpreferenced SOES order at the same bid or offer in the same security until 17 seconds have elapsed, absent a quotation update by the market maker within such 17-second period. The additional 2 seconds were added to the 15-second delay to allow time for market makers to receive reports of SOES executions.

March 1998

SEC publishes, for public comment, a proposed NASD rule change to establish a new Integrated Order Delivery and Execution System. The system would replace existing SOES and SelectNet systems and provide an integrated order routing and execution system featuring:

1. Automatic trade executions for all.

The system is expected to provide investors and traders immediate and automatic executions in strict time priority. It would provide a limit order file through which both limit orders and market maker quotes would be subject to automatic execution. However, it would allow market makers to turn the system off momentarily to prevent themselves from getting hit while handling telephone orders.

2. No size limits and no ephemeral quotes.

The system would allow orders of up to 999,999 shares to be entered, with a minimum life of 10 seconds.

3. No multiple executions.

A market maker would have to honor only one execution at its quoted price and would have 17 seconds to update its quote. For trades of more than 1,000 shares the market maker would have the option of declining the trade if a trade had already been executed at the quote or if the market maker was updating its quote.

NASD submits proposed rule change to permanently allow market makers to quote actual size by reducing the minimum quotation size requirement for market makers in all securities listed on Nasdaq to one normal unit of trading (at least 100 shares or multiples thereof). NASD staff study of test period found that the actual size rule had no effect on market quality or

SOES access. One commentator opposed to the rule change disputed NASD's finding, contending that the actual size rule resulted in substantial reduction in market depth and liquidity, especially during times of market stress.

July 1998

SEC approves a NASD proposed rule change to allow market makers to quote permanently in actual size by reducing the minimum quotation size requirement for all Nasdaq securities to one normal unit of trading of 100 shares and multiples of 100. In its study of the effects of the actual size rule, NASD stated that artificial minimums were no longer necessary and that the rule allows market makers to better manage risks with no harm to market quality or SOES access.

Comments From NASD

NASD®
Parent of The Nasdaq Stock Market

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August 12, 1998

Thomas J. McCool
Director, Financial Institutions and Market Issues
General Government Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. McCool:

The NASD appreciates this opportunity to review and provide formal comments on the GAO draft report titled *Securities Market Operations: SOES Provides Day Traders a Trading Advantage Over Other Market Participants* (job code 233540).

The draft report covers a complex area where strong and often widely divergent views dominate the discussion of the issue. The GAO report provides a balanced, thorough, and accurate view of this difficult terrain, which has changed significantly since problems with SOES first became apparent. We regret that it could not be available to the House Subcommittee on Finance and Hazardous Materials for its August 3, 1998 hearings on SOES, where we believe it would have greatly informed the debate. It should, however, provide a valuable resource to assist Congress in any consideration it might undertake in the area of SOES in the future.

We have reviewed the GAO draft report internally and have provided your staff with a series of edits to further enhance the report's accuracy. Other than those technical changes, which your staff has agreed to make, we have no additional comments on the report.

Thank you again for the opportunity to comment on this report, which we believe adds importantly to the discussion of how problems with SOES have been — and can be — resolved to improve the market for investors.

Sincerely,

Frank Zarb

Comments From the Securities and Exchange Commission

DIVISION OF
MARKET REGULATION

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

August 17, 1998

Mr. Thomas J. McCool
Director, Financial Institutions
and Market Issues
General Government Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. McCool:

I am writing to comment on the General Accounting Office's ("GAO") draft report entitled "The Effects of SOES on the Nasdaq Marketplace" ("Draft Report"). We provided other technical comments in telephone conversations on June 23, 1998 and August 5, 1998. The issues the Draft Report addresses are complex and I commend the GAO on its work on such a difficult task. As the GAO explains in the Draft Report, there are fundamental disagreements between Nasdaq market makers, SOES day traders, and others over the impact of SOES on the over-the-counter market. As a result, any observations must be tempered by the understanding that all of the parties involved have vested interests in the way that SOES and other systems operate. That being said, I generally agree with the GAO's conclusions.

The GAO recognized that SOES has made a positive contribution to market pricing efficiency. The GAO concluded, however, that SOES day traders enjoy an advantage over other market participants, which is contrary to the goal of fair competition. In my view, this conclusion overstates the situation. In light of the evolving Nasdaq market structure, I do not believe that the observations in the GAO's Draft Report support a conclusion that SOES day traders currently enjoy an unfair advantage over other market participants. As shown in the Draft Report, SOES trading has adapted itself to the specific structure and rules governing SOES and the Nasdaq market. The NASD, in consultation with the Commission, has striven over the course of several years to revise SOES and Nasdaq structures to maintain the benefits of order execution and pricing efficiency while addressing disparities among participants. Most recently, the NASD revised its mandatory quotation size requirements to give market makers the freedom to set the size of their quotations which will allow market makers to better manage risk.

Mr. Thomas J. McCool
August 17, 1998
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The GAO recommends that the SEC ensure that any trading system that replaces SOES provide for the immediate execution of investors' small orders at the best possible prices. I agree with the GAO that immediate automatic execution of small orders performs an important market function and should be retained in any system proposed to replace SOES. The ability of retail investors to access the markets is particularly important in times of market stress. I would note a March 1998 study conducted by the NASD that concluded that the ability of investors to access market maker capital, including through SOES, was not significantly affected by the market stress of October 27 and 28, 1997.

In considering any proposal to replace SOES, the Commission will, as you recommend, consider whether the system is designed to treat all market participants fairly. We will also consider whether the new system is designed to foster competition, remove impediments and perfect the mechanism of a free and open market, and, most importantly, protect investors and the public interest. Moreover, the NASD's proposal must not permit unfair discrimination between customers, issuers, brokers or dealers. As the GAO recommends, the Commission will require the NASD to provide adequate data and analysis so that we can ensure that the proposal complies with the requirements of the federal securities laws.

Thank you again for this opportunity to provide comments to the GAO as it prepares its final draft of the report.

Sincerely,

Richard R. Lindsey

Richard R. Lindsey
Director

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